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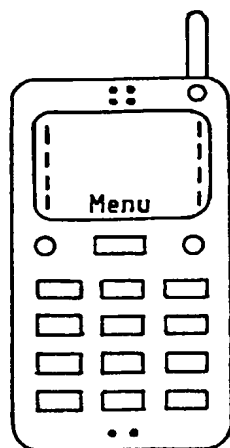
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(54) Title: ARRANGEMENT WITH A MOBILE PHONE



(57) Abstract: The invention relates to an arrangement with a mobile phone, in which arrangement information is transmitted with the aid of a first mobile phone via a mobile services switching centre to one or more destinations defined for the first mobile phone, such as to a second mobile phone, to a telephone of the fixed network, to a control room, to an alarm centre, or the like. The first mobile phone is arranged to give an alarm, or to switch on and give an alarm via the mobile telephone network, when the charging voltage supplied to the first mobile phone changes past its limit, after which said alarm or switching-on and alarm occurs, and that the equipment connected to the first mobile phone is connected to the battery charging connector of the first mobile phone.

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Arrangement with a mobile phone

The invention relates to an arrangement with a mobile phone according to the preamble of independent claim 1, in which arrangement information is transmitted with the aid of a first mobile phone via a mobile services switching centre to one or more destinations defined for the first mobile phone, such as
5 to a second mobile phone, to a telephone of the fixed network, to a control room, to an alarm centre, or the like.

There exist numerous solutions and applications in many technological areas for transmitting information to another place. So-called robot telephones have become more common in recent years, although they generally require a sub-
10 scriber connection to the fixed network. Wireless communication devices, particularly mobile phones, have made it possible to arrange remote monitoring and control in order to analyse human vital functions or to protect property or to control the operation of equipment in many ways. The publication FI 4900U presents an alarm monitoring mobile phone, which enables the moni-
15 toring of different functions in the same way as an alarm centre. Then necessary modifications and additional functions for the alarm monitoring have been made already in the actual mobile phone, which increases even substantially the costs regarding design and manufacture of a telephone of this kind. Examples of complicated and thus generally expensive alarm arrangements
20 are found e.g. in the publications US 5,568,535, WO 99/21742 and EP 366 378. The publication EP 417 944 presents a solution particularly for detecting car thefts by using an arrangement built in a telephone, the arrangement being controlled by an external on/off signal according to a signal received from a sensor via a wire or in a wireless manner. There is no mention of the use of the
25 battery charging connector. The publication EP 909 083 presents how information provided by a detector is transmitted further with the aid of a mobile phone. However, this utilises a circuit disposed in the mobile phone to which the information is brought, and for this purpose, it is not possible at all to use the charging connector.

30 The object of the invention is to present an arrangement which makes it possible to use the mobile phone as well as a conventional mobile phone, but also as an information transmission means with the aid of an equipment connected to the mobile phone's battery charging connector, particularly for monitoring

and alarm functions. An additional object is to use a used mobile phone during the last period of its life as an alarm or monitoring device or the like. Even if a mobile phone would be slightly out of order, for instance due to a worn keypad, such a mobile phone can still operate several years in the arrangement according to the invention.

An object is to present an arrangement where the mobile phone cannot be found by a mobile phone locator, because before the connection the mobile phone is in the idle state and disconnected from the network.

The object of the invention is attained in the manner presented in the independent claim 1 and in the other claims. According to the invention information is transmitted with the aid of the first mobile phone via a mobile services switching centre to one or more destinations defined for the first mobile phone, such as to a second mobile phone, to a telephone of the fixed network, to a control room, to an alarm centre, or the like. If the first mobile phone is arranged to give an alarm, or to be switched on and to give an alarm, via the mobile telephone network when the charging voltage supplied to the first mobile phone changes past that limit after which said alarm is activated, or when switching on and alarm is activated, then this occurrence can be utilised in order to generate an alarm. It is also quite simple to form such a function, as said limit or limit range can be unambiguously determined. If the equipment connected to the first mobile phone is connected to the battery charging connector of the first mobile phone, then the connection can be made very simple, durable and cheap regarding its connector arrangement, and there is no risk that the communication connector of the mobile phone, which has a multiple strip structure and which thus is structurally very sensitive, would be susceptible to any kind of mechanical and electrical stress or strain. The use of the battery charging connector is also extremely easy, as this connector requires only two leads in the most common case.

If said equipment connected to the first mobile phone is connected to alarm and/or monitoring devices, such as one or more door switches and/or thermal relays and/or level monitoring devices and/or fire alarm devices and/or burglar alarm devices and/or motion detectors and/or counter devices and/or the like, then in quite a simple way an equipment and at the same time an arrangement according to the invention connected to the mobile phone, which arrangement is very versatile and can be applied to many uses, is obtained. The arrangement according to the invention is so simple that a person with even moder-

ate installation experience can utilise the invention, at least regarding the low-voltage connections. To a person skilled in the art connecting the numerous applications of the invention to purposeful use depends mainly on the extent of the imagination.

- 5 If said information transmission is arranged to be repeated, this provides a very reliable information transmission, even if the first mobile phone from time to time would be located e.g. in a shadow region of the network.

If the repetition is arranged to occur based on time and/or the number of events, then it is possible to monitor the situation in the alarm object particularly at certain times, or to monitor and to take the required measures as desired.

- 10 If said transmitted information is in the form of short messages (SMS), then the receiving object can immediately obtain quite a clear message in text form, which shows what it concerns, and at the same time it is possible to deduce what actions are required.

If the transmitted short message contains information about the number of changes in the charging voltage during the setting interval, this information can in many cases be utilised in the examination of the function and events in the arrangement. In some cases a feature of this kind can bring information to the object which is sufficient to the degree that there is e.g. no need to visit the location of the first mobile phone to make a check there.

- 20 If the repeatedly sent information is utilised for determining the position of the first mobile phone, then it is possible to observe in which mobile services switching centre's area the respective communication device is currently located, and even in which sector it is. A positioning like this is helpful for instance in locating and tracing a stolen vehicle or container.

If said equipment connected to the first mobile phone receives its energy from a device connected to the electrical network, or also from an accumulator or a battery, then the equipment will be quite simple and reliable in its operation regarding its electrical supply. The manner and object of the application will in most cases give hints regarding implementing a suitable energy arrangement to the designer of the arrangement according to the invention.

If the alarm acknowledgements, the operation and stand-by states of said first mobile phone can be controlled by a second mobile phone or by another equipment receiving the alarm, then the arrangement according to the invention together with a mobile phone can most often resulting in a very versatile arrangement which is suitable for several applications. As said second mobile phone or other equipment receiving the alarm can be located very far from the first mobile phone and thus from the monitored or controlled object, the required functions can be effected remotely and without a visit to the location.

The invention is presented in more detail in the following with reference to the enclosed drawing, in which

Figure 1 shows schematically a mobile phone,

Figure 2 shows schematically the power supply for the mobile phone according to figure 1,

Figure 3 shows schematically the battery charging wire of the mobile phone according to figure 1 intended for use in a vehicle, and

Figure 4 shows schematically a circuit with the aid of which the alarm function is provided by the mobile phone according to figures 1 and 3.

In the figure 1 of the drawing the reference number 1 shows a mobile phone which usually at point 2 has a connection point for the connector of the wire intended for charging the battery.

Figure 2 shows the mobile phone's power supply 3 with the aid of which the battery of the mobile phone 1 can be charged by plugging the connector 4 into point 2. The pins 5a, 5b of the power supply 3 will supply mains voltage (230 V) from an outlet (not shown). A power supply 3 of this kind is generally supplied together with the mobile phone 1 when it is purchased.

Figure 3 shows a so-called car charging wire 6 having a tip which fits in the cigarette lighter and a connector 4, which fits in the mobile phone's charging connector at point 2. Such a car charging wire 6, which normally is sold as additional equipment, is generally necessary if the mobile phone 1 is frequently used in a car.

Figure 4 shows a circuit which provides an alarm function according to the invention by using the vehicle charging wire 6 and the mobile phone 1. The

reference number 7 represents the car battery, from which a cable 8 transfers energy for the needs of the vehicle. This cable has a branch via a fuse 9 to a switch 10, which is further connected to an auxiliary outlet 11, into which the car charging wire 6 suitably can be connected. The switch 10 can be for instance a so-called vibration sensitive switch, which closes when a person enters the car. The arrangement according to the invention operates in this embodiment as an alarm device in the following way: the mobile phone 1 is switched off, but the charging wire 6 is connected to the auxiliary outlet 11 and the connector 4 to the point 2. When e.g. a person wishing to take the car illegally enters the car, then the switch 10 closes and the car charging wire 6 begins to supply current to the mobile phone 1, which switches into operation, establishes a connection to the network and calls a predefined telephone, which can be for instance on the car owner's bedside table. Very soon after the break-in the car owner receives a notification about the fact that somebody is now illegally in the car, and he or she may take the required actions. The outlet 11, and also the other components 6 and 1 must be located in a less visible place, in order to avoid immediate detection. If the switch 10 is not of a locking model it is necessary to arrange a power supply, for instance through a relay (not shown), in which connection the relay receives its control current from between the switch 10 and the outlet 11, and in which the relay, once the switch 10 has supplied current to the relay, begins to supply a continuous current to the outlet 11. If the mobile phone is disconnected from the mobile telephone network, but in readiness to be connected to the network, then before the alarm operation is started the mobile phone will not reveal itself by establishing a connection to the network from time to time. Then a possible mobile phone can not be located by any device manufactured for that purpose, and not by using for instance a radio receiver for the examination, which receiver also will reveal by a certain sound if a mobile phone is establishing connections to the mobile telephone network in its neighbourhood.

Applications for the arrangement according to the invention will be found in great numbers in different fields. The mobile phone's battery charging connector 2 according to the invention is supplied with suitable current through the connector 4 or the like, whereby the mobile phone 1 either immediately establishes a contact or connects to the network, and only then it will make a call to one or more desired destinations. For instance a warehouse can be monitored so that a common motion detector provided with an infrared detector is connected to monitor the object, a passage or even a courtyard, and a power sup-

ply 3 and a mobile phone 1 is connected to the arrangement. When an unauthorised person enters the monitored area, the motion detector supplies current to the power supply 3, which in turn supplies current via the connector 4 to the mobile phone 1, which is programmed to supply the alarm information, e.g. to the security guard, who takes the appropriate measures.

It is generally recommended that the telephone is programmed to react on the supply voltage rising from zero, or from close to zero, past a limit to its nominal value, but of course it can be programmed in the opposite manner. Because the telephone's own battery usually has power for several days, an alarm or some other function can be performed and directed to a desired location. If the mobile phone is programmed to act also on a value when the charging voltage is falling (by an opening alarm contact) the battery will have a longer lasting charge than when the mobile phone is set to operate on a rising charging voltage (by a closing alarm contact).

Here the mobile phone represents a mobile phone including its battery and antenna, which may be built-in or external. The mobile phone may be for example of the GSM type, or a telephone of a newer generation.

A so-called time-based connection establishment means such monitoring state and settings, where the first mobile phone generates an alarm, or establishes a connection and generates an alarm through the mobile telephone network, sending to the receiver an alarm and/or a short message about the number of changed charging voltages during a defined period, or at a certain point in time according to the settings. If the object is not a counter function, but to monitor the mobile phone geographically, then an alarm call without a short message is sufficient as the alarm form. A counter function is also possible, where the first mobile phone stores in memory the points in time of the changes of the charging voltage, without transmitting the information via the mobile telephone network, so that an examination at a later moment is possible.

A so-called event-based connection establishment means such monitoring state and settings, where the first mobile phone generates an alarm or establishes a connection and generates an alarm through the mobile telephone network, sending to the receiver an alarm and/or a short message about the number of changed charging voltages when the set number is reached. For instance, the set limit 1 means an immediate alarm. The number of the changes can also be seen on the display of the first mobile phone, whereby the mobile

phone can also be used as a local counter. Alarm blocking for a certain period is also a possible function.

5 The mobile phone contains a setting where the mobile phone is connected to the mobile telephone network and remains so connected only during a short time in the alarm and/or short message situation, waiting for alarm acknowledgement, or for a new control command or setting from the receiving equipment. In this kind of operation the battery of the first mobile phone will last probably at least one week, if not clearly much longer.

10 With the aid of the arrangement where the mobile phone gives an alarm at the first change in the charging voltage it is also later on possible to solve very clearly when the alarm or any other event relating to it has occurred. Generally the memory of the mobile phone 1 stores information about the times of call establishment, but the information can also be obtained from the mobile phone operator, which for instance in the case of an illegal use of a car is able to find
15 out the area of the mobile services switching centre where the mobile phone was and is located at any given moment, and even a more detailed location with the aid of the so-called sector definition.

According to the situation the mobile phone 1 can be programmed to establish a connection also to more destinations, for instance to the security guard, the
20 ambulating patrols, the security chief, the foreman, the chief of special personnel, and so on. Some mobile phones already have numerous functions, which can be selected and which are at least partly applicable in order to utilise this invention.

The invention is not restricted to the enclosed embodiment, but numerous
25 modifications of it are conceivable within the scope of the enclosed claims.

Claims

1. An arrangement with a mobile phone, in which arrangement information is transmitted with the aid of a first mobile phone via a mobile services switching centre to one or more destinations defined for the first mobile phone, such as to a second mobile phone, to a telephone of the fixed network, to a control room, to an alarm centre, or the like, **characterised** in that the first mobile phone is arranged to give an alarm, or to switch on and give an alarm via the mobile telephone network, when the charging voltage supplied to the first mobile phone changes past its limit, after which said alarm or switching-on and alarm occurs, and that the equipment connected to the first mobile phone is connected to the battery charging connector of the first mobile phone.
2. An arrangement according to claim 1, **characterised** in that said equipment connected to the first mobile phone is connected to alarm and/or monitoring devices, such as one or more door switches and/or thermal relays and/or level monitoring devices and/or fire alarm devices and/or burglar alarm devices and/or motion detectors and/or counter devices and/or the like.
3. An arrangement according to claim 1, **characterised** in that said transmission of information is arranged to be repeated.
4. An arrangement according to any previous claim, **characterised** in that the repetition is arranged to occur on the basis of time and/or on the number of events.
5. An arrangement according to claim 4, **characterised** in that said transmitted information is in short messages (SMS).
6. An arrangement according to any previous claim 3 to 5, **characterised** in that the transmitted short message contains information about the number of charging voltage changes during a set interval.
7. An arrangement according to any previous claim, **characterised** in that the repeatedly transmitted information is utilised for the positioning of the first mobile phone.
8. An arrangement according to any previous claim, **characterised** in that said equipment connected to the first mobile phone receives its energy from a

device connected to the electric network or from an accumulator or from a battery.

9. An arrangement according to claim 1, characterised in that the alarm acknowledgements, operational and stand-by states of said first mobile phone
5 can be controlled with another mobile phone or with other equipment receiving the alarm.

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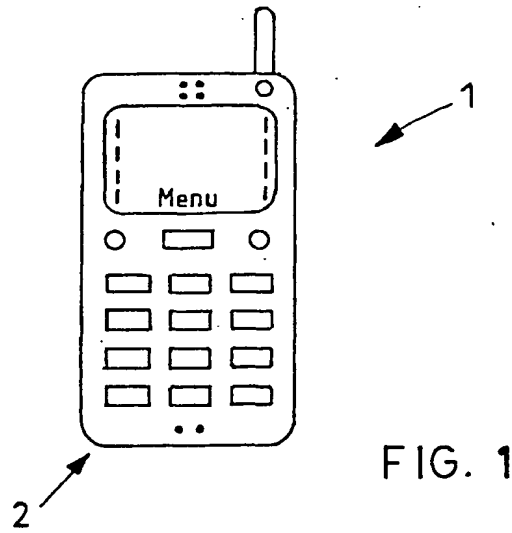


FIG. 1

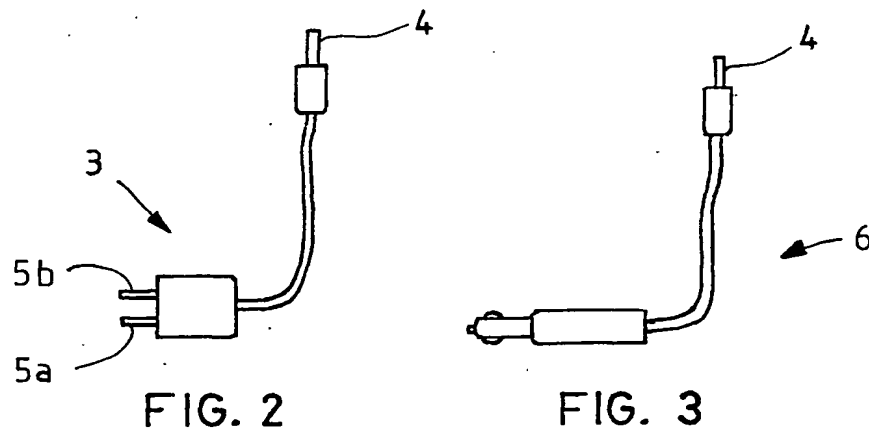


FIG. 2

FIG. 3

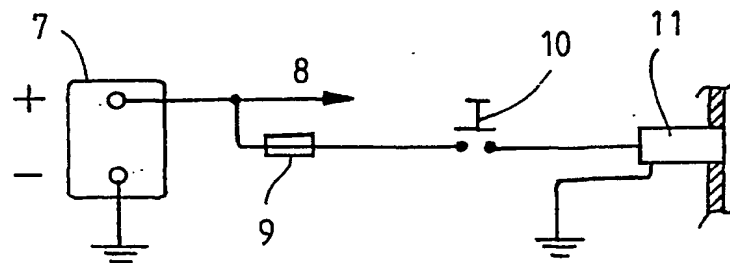


FIG. 4

INTERNATIONAL SEARCH REPORT

International application No. .

PCT/FI 01/00502

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: H04M 11/04, B60R 25/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: H04M, H04B, B60R, G08B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 0417944 A2 (NOKIA MOBILE PHONES LTD.), 20 March 1991 (20.03.91), column 1, line 1 - line 37; column 2, line 9 - column 3, line 49, abstract	1-5,7-9
A	---	6
Y	GB 2119552 A (CARLOS TINOCO GUTIERREZ ET AL), 16 November 1983 (16.11.83), page 1, line 46 - line 56; page 1, line 108 - line 126, abstract	1-5,7-9
A	---	6

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
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"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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"&" document member of the same patent family

Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 01/00502

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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A	EP 0366378 A2 (HARADA INDUSTRY CO., LTD.), 2 May 1990 (02.05.90), column 1, line 47 - line 54; column 3, line 2 - column 4, line 18	1-9
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INTERNATIONAL SEARCH REPORT

Information on patent family members

02/08/01

International application No.

PCT/FI 01/00502

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